STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI
GOVERNOR

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Worcester Energy Partners, Inc.
Washington County
Deblois, Maine
A-216-77-1-A

Departmental
Findings of Fact and Order
Air Emission License
New Source Review License

After review of the air emission license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A, Section 344, Section 590, 06-096 CMR 115, the Department finds the following facts:

I. Registration

A. Introduction

FACILITY	**Worcester Energy Partners, Inc. (WEPI)**
LICENSE TYPE	New Source Review (NSR) Major Modification
NAIC CODE	4911 – Electrical Generation
NATURE OF BUSINESS	Electric Generating Station
FACILITY LOCATION	Deblois, Maine
DATE OF NSR LICENSE ISSUANCE	March 10, 2009

B. New Source Review (NSR) License Application Overview

WEPI has submitted a NSR application under 06-096 CMR 115 to increase the facility's wood fired boilers allowable CO emission rate from 0.192 lb/MMBtu to 0.75 lb/MMBtu. Also, WEPI has requested to establish startup and shutdown conditions, include the combustion of specification waste oil, clarify the stack testing schedule, adjust steam production to reflect manufacturer design standards, and modify NOx emissions averaging times.

This license incorporates all Major NSR conditions for the facility from the original license along with an updated Best Available Control Technology (BACT) for all criteria pollutants. Also, a new Ambient Air Quality Modeling Analysis was performed supporting the new emission limits.

C. Emission Equipment

The following emission units are addressed by this license:

EMISSION UNIT ID	UNIT CAPACITY	UNIT TYPE
Boiler #1	135.5 MMBtu/hr	Biomass boiler
Boiler #2	135.5 MMBtu/hr	Biomass boiler
Boiler #3	135.5 MMBtu/hr	Biomass boiler
Blackstart Generator	9.76 MMBtu/hr	Generator
353 Generator	2.93 MMBtu/hr	Generator

Worcester Energy has additional activities not listed in the emission equipment table above that are considered insignificant per 06-096 CMR 115 Appendix B.

D. Application Classification

The application for WEPI does not violate any applicable federal or state requirements. Additionally, the modification of a major source is considered a major modification based on whether or not expected emissions increases exceed the "Significant Emission Increase Levels" as given in Definitions Regulation, 06-096 CMR 100 (last amended December 1, 2005).

The emission increases are determined by subtracting the current boiler allowable emissions preceding the NSR license from the maximum future license allowed emissions. Due to the fact no boiler modifications or fuel changes are being performed, only CO emissions from the boilers will be compared for this NSR amendment. The results of subtracting the average actual CO emissions from the maximum future license allowed CO emissions are as follows:

Pollutant	Current Boiler Actual (tons/year)	Future Permit (tons/year)	Net Change (tons/year)	Significance Level (tons/year)
CO	352.9	1335.4	+982.5	100

Also, WEPI is requesting the following:

- Modify the NOx emission limit averaging time to a 24-hour block average.
- Change the steam production limit to more accurately reflect manufacturer design standards.
- Establish allowances for excursions of opacity and gaseous emissions from the boilers which occur during periods of start-up, shutdown, and periodic maintenance.
- Allow the combustion of specification waste oil.

- Clarify the stack testing schedule and control requirements for particulate matter.
- Remove peat bagging conditions since no peat processing occurs at the facility.

After a review of the original Major NSR license, subsequent amendments, and renewal licenses; it was discovered that Boiler #3 was added, increases to Boilers #1 and #2 capacities were made, and emission limits were changed since license, A-216-73-A-N, was issued on February 26, 1986. Although these changes were licensed (through Air Emissions License A-216-73-B-A issued January 8, 1987) and the required ambient air quality analysis were performed in state actions, it is unclear (after the file review) whether or not these changes had gone through the appropriate public review periods required under federal NSR provisions. Also, the opacity limit on the three fluidized bed boilers was changed from 5% to 20% through a minor revision, A-216-71-I-M, issued October 28, 1998. This change may also not have been processed appropriately.

Therefore, the processing of this application documents all the changes at the facility since the original license and subjects these proposed changes to the full New Source Review processing procedures under the Environmental Protection Agency's (EPA) Major NSR program.

Accordingly, the application has been processed as a New Source Review Major Modification in accordance with 06-096 CMR 115. This requires a Best Available Control Technology (BACT) determination along with an updated Ambient Air Quality Modeling Analysis for all criteria pollutants.

II. EMISSION UNIT DESCRIPTION

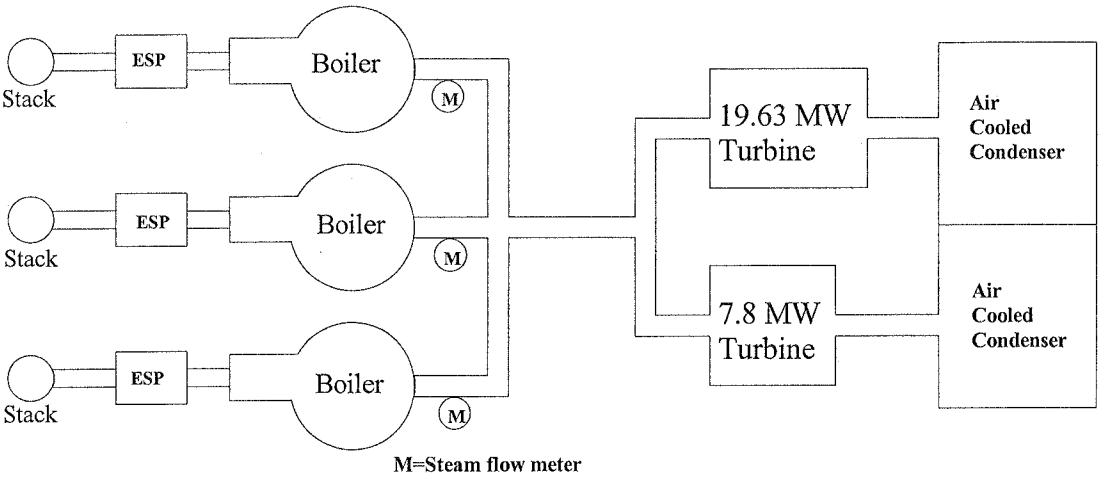
A. Process Overview

WEPI consists of a fuel handling system, three fluidized bed biomass fired boilers followed by an electrostatic precipitator for each unit. Biomass (which includes sawdust and wood chips) is received from enclosed trailer vans and off loaded via a belt conveyor to a silo where it is stored. Fuel is fed to each boiler by a drag chain with an adjustable rotary seal valve. The chips enter a bed of refractory sand which is fluidized by the primary air. The mixing action of the sand promotes a robust combustion zone.

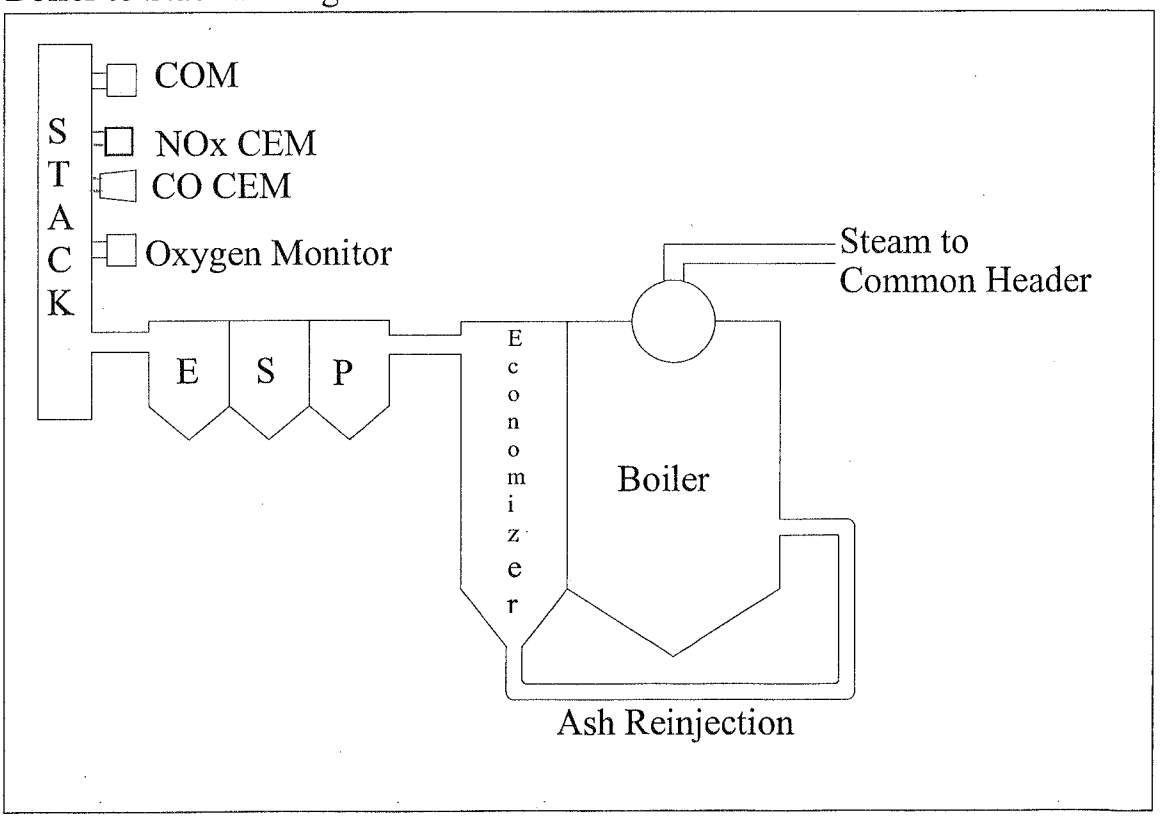
Fuel oil can be used to heat the primary air, which raises the fluidized bed temperature to that required to ignite the main fuel. The more commonly used method of starting the first boiler is to make a "bonfire" on the sand. Once one boiler is up and running its heat may be used to get the bed of the other boilers up to temperature. Primary, secondary, and tertiary air is supplied by a forced draft fan and is heated in a tubular heater. Combustion gasses from each boiler pass

through an economizer followed by an electrostatic precipitator (ESP) and vent through a 185' AGL stack. Ash from the economizer is re-injected pneumatically into the boiler. Ash is wetted before discharge to enclosed transport vehicles. Ash is disposed of in accordance with Department rules.

Basic System Arrangement



Boiler to Stack Arrangement



B. Boilers #1, #2 and #3

Boilers #1, #2 and #3 are atmospheric fluidized bubbling bed boilers, manufactured and installed in 1988 with a maximum firing rate of 135.5 MMBtu/hr each firing biomass and are subject to the provisions of New Source Performance Standards (NSPS) requirements 40 CFR Part 60, Subpart Db. Boiler #1, #2 and #3 steam production rate is 92,000 #/hr each, based on a feed rate of 15.0 tons/hour at 4500 Btu per pound of biomass fuel. This is a change from the original license and is discussed in Section III (C) of this license.

Each boiler has two auxiliary burners, each having a maximum firing rate of 33.0 MMBtu/hr firing #2 fuel oil with a maximum sulfur content of 0.05%.

The operation and maintenance of an electrostatic precipitator (ESP) on each boiler controls particulate emissions. WEPI operates and monitors each of the three ESPs in order to meet the licensed particulate and opacity emission limits. WEPI shall operate, at a minimum, the number of banks which successfully demonstrated compliance during the most recent PM stack test.

III. BEST PRACTICAL TREATMENT (BPT)

A. INTRODUCTION

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in 06-096 CMR 100 of the Department's regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

B. BACT ANALYSIS

1. Particulate Matter (PM and PM_{10})

WEPI's original BACT determination in 1986 required an electrostatic precipitator (ESP) for each unit and a PM limit of 0.027 lb/MMBtu. This license will establish new PM and PM_{10} lb/MMBtu emission limits.

Potential control technologies for PM and PM_{10} emissions from biomass boilers include mechanical collectors, wet scrubbers, electrostatic precipitators (ESPs),

fabric filters, and good combustion practices. The use of cyclones (or multicyclone) as mechanical collectors provides particulate control for many wood-fired boilers. The efficiency of this arrangement varies from 25 to 65 percent. The most widely used wet scrubbers for wood-fired boilers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85 percent or greater have been reported for venturi scrubbers operating on wood-fired boilers. Fabric filters (i.e., baghouses) have limited applications to wood-fired boilers. The principal drawback to fabric filtration is fire danger arising from the collection of combustible carbonaceous fly ash. Steps can be taken to reduce this hazard, including the installation of a mechanical collector upstream of the fabric filter to remove large burning particles of fly ash (i.e., "sparklers"). Despite complications, fabric filters are generally preferred for boilers firing salt-laden wood. This fuel produces fine particulates with a high salt content having a quenching effect, thereby reducing fire hazards.

ESPs are employed when collection efficiencies above 90 percent are required. When applied to wood-fired boilers, ESPs can be used downstream of mechanical collectors which remove larger-sized particles. Collection efficiencies of 90 to 99 percent for PM have been observed for ESPs operating on wood-fired boilers. Each of WEPI's biomass boilers are fitted with three field ESPs to control particulate emissions, which represents the highest level of control. WEPI currently has a limit of 0.027 lb/MMBtu for both PM and PM_{10}. This limit is consistent with other facilities in the State of Maine and within limits identified in EPA's RACT/BACT/LAER Clearinghouse (RBLC) database. Facilities and emission limits found in the RBLC database ranged from 0.012 lb/MMBtu to 0.24 lb/MMBtu and are found in Appendix A of WEPI's July 14, 2008 supplemental application submittal. Per this New Source Review license, the PM and PM_{10} limit will now be 0.02 lb/MMBtu.

In WEPI's initial Part 70 Air Emissions license A-216-70-A-I, issued June 22, 2002, the license states WEPI could perform additional particulate emission testing to demonstrate compliance with alternative operating scenarios. Through a Significant Modification issued February 26, 2008, WEPI was allowed to operate the minimum number of ESP fields per boiler necessary to meet the PM limit of 0.02 lb/MMBtu. WEPI has done repair work to the ESPs over the years, which has entailed replacing parts and adding new controllers, etc. WEPI has not, however, made any modifications to the size or fundamental design of the ESP and/or its fields, so the fundamental control device remains unchanged. To date, WEPI has been able to demonstrate compliance with this PM limit through stack testing, while operating only two ESP fields per boiler. In the latest stack test conducted in December of 2007, the measured particulate emissions for Boiler #1,

Boiler #2 and Boiler #3 were 0.011 lb/MMBtu, 0.020 lb/MMBtu, and 0.005 lb/MMBtu, respectively.

In addition to periodic stack testing, WEPI monitors its ESP performance using Neundorfer MVC-3 Adaptive Voltage Control monitors. These monitors display real-time primary voltage, primary current, and secondary current which are recorded once per shift and will meet the 98% uptime requirement for parameter monitors as specified in Specific Condition (2)(A). Accordingly, the controllers are preset with a target phase angle to maximize ESP operating power, but the system is designed to modulate the phase angle in the event of start-up, shutdown, and interruptions such as sparking. Under normal operating conditions, the phase angle is known and the secondary voltage can be calculated from the primary voltage and current and the secondary current, if needed.

1) Primary voltage on each field
2) Primary and secondary current on each field

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PM/PM10 Compliance Assurance Monitoring (CAM)

A. PM/PM10 CAM for each of the three ESPs [40 CFR Part 64]

Condition	Indicator: Opacity
1. Measurement Method	The opacity is measured using a Continuous Opacity Monitor that meets the requirements of 40 CFR, Part 60, Appendix B.
2. Indicator Range	An excursion is defined as opacity in excess of 10% on a 30 minute block average except during periods of cold start-up. An excursion will require: an inspection of the ESP within 4 hours of documentation of an excursion, corrective action, and a reporting requirement.
3. Data Representativeness	The opacity is monitored using a Spec 1 opacity monitor.
4. QA/QC	QA/QC procedures are set forth in 40 CFR, Part 60, Appendix B.
5. Monitoring Frequency	The opacity is measured continuously.
6. Data Collection Procedure	The opacity is recorded continuously.
7. Averaging Period	30 minute block average

B. WEPI shall operate and monitor the ESPs within the ranges established by their CAM plan. Prior to making any changes to the approved CAM plan, WEPI shall notify the Department and, if necessary, submit a proposed modification to this permit to address the necessary monitoring changes. Such a modification may include, but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters. [40 CFR 64.7.e]

C. Upon detecting an excursion, WEPI shall restore normal operation of the control equipment as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. [40 CFR 64.7.d]

D. In addition to the other reporting requirements in this license, any excursions shall be reported on semiannual reports. If excursions occur, WEPI must also certify intermittent compliance with the emission limits for the control device monitored on their annual compliance certification. [40 CFR 64]

PM/PM_{10} BACT Conclusion

The ESP add-on control technology, in addition to the continued application of good combustion practices to ensure complete combustion, is considered BACT for particulate matter from WEPI's biomass boilers.

2. Sulfur Dioxide (SO_2)

WEPI is currently licensed to meet a limit of 3.4 lb/hr demonstrated by stack testing in accordance with this license. WEPI is currently burning wood as a primary fuel and is permitted to burn #2 fuel oil at 0.05% sulfur as an auxiliary fuel only for boiler start-up operations. WEPI does not use add-on controls to limit SO_2 from its boiler as the sulfur content of its fuels is inherently low.

Technically feasible control options for a biomass boiler include spray dryer absorbers, wet scrubbers, sulfur-absorbing bed compounds such as limestone or dolomite, and dry sorbent injection followed by either a fabric filter or an ESP. Because of the inherently low sulfur contents of the WEPI's fuels, these technologies are not justifiable. Thus, the Department will not require WEPI to employ further SO_2 controls.

The SO_2 limit included in the draft license is 3.4 lb/hr. This equates to approximately 0.025 lb/MMBtu for each of the 135.5 MMBtu/hr boilers. Because WEPI only has the capacity to burn oil in two 33 MMBtu/hr burners of low sulfur diesel oil (0.05% sulfur content or less), WEPI cannot exceed the limit of 3.4 lb/hr

for each boiler while burning the prescribed oil. At this time, the Department will not require the use of ultra low sulfur oil because its availability is in question in Washington County. Modeling performed as part of its application submittal documented that WEPI easily meets the ambient air quality standards for SO_2 while combusting 0.05% sulfur oil in its oil-fired burners.

To meet BACT, WEPI will continue to burn inherently low sulfur fuels (wood and 0.05% sulfur oil) and to meet a licensed SO_2 limit of 3.4 lb/hour from each boiler.

3. Nitrogen Oxide (NOx)

The currently licensed NOx emission limits for WEPI are 0.26 lb/MMBtu and 35.2 lb/hr for each boiler (Boiler 1, 2, and 3). The license states that the NOx lb/hr limit is on a one (1) hour average and can be demonstrated upon request by stack testing in accordance with the license. The method for documenting compliance with the NOx lb/MMBtu emission limit was not identified in the original license or subsequent renewals or amendments. WEPI has proposed to lower its NOx limit to 0.23 lb/MMBtu, on a 24-hour basis through use a continuous emission monitor (CEM), and continue to demonstrate compliance with the lb/hr limit by stack testing.

NOx formation occurs by two mechanisms: thermal NOx and fuel NOx. The primary mechanism of NOx formation from biomass boilers is thermal NOx. Thermal NOx arises from the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion of air. Thermal NOx is typically formed at elevated temperatures and pressures and increases exponentially with temperature.

The second mechanism of NOx formation is called fuel NOx. Fuel NOx is produced from the reaction of fuel-bound nitrogen compounds with oxygen, and is typically present in very small quantities relative to thermal NOx, unless NOx control technologies suppress the formation of thermal NOx to levels where fuel NOx becomes more significant.

WEPI's three units are considered fluidized bed boilers. Fluidized bed combustion occurs in a combustion zone that is suspended in the boiler by a "bed" of air. This combustion technique leads to large amounts of air intermixing with the fuel which keeps combustion zone temperatures relatively low, inhibiting the formation of NOx. Since the inherent design of a fluidized bed boiler combusts at much lower temperatures than a stoker, fixed grate, or traveling grate boilers, where combustion zone temperatures are much greater, NOx emissions are lower

than these other units. Thus, the boiler design is optimal for minimizing NOx prior to consideration of post combustion NOx control systems.

Post-combustion control options include Selective Catalytic Reduction (SCR), Selective Non-Catalytic Reduction (SNCR), and Regenerative Selective Catalytic Reduction (R-SCR). All three post combustion systems are NOx reduction techniques in which urea or ammonia is injected into the flue gas to selectively reduce NOx to nitrogen and water. Because of the excessively high operational costs, including significant additional heat requirements, efficiency losses from excessive back pressure, chemical usage, and catalyst replacement WEPI does not propose using SCR or R-SCR as BACT.

SNCR is the simplest and least expensive of the three NOx control technologies as a urea or ammonia solution is simply injected into the boiler cavity at pre-determined locations and rates and does not require a catalyst system. It is capable of reducing NOx emissions by between 35 and 75 percent depending on the situation.

The actual cost of NOx removal based on WEPI's 2007 fuel usage of 280,327 tons of wood (vs. permitted 395,660 tons, a 71% capacity factor) and the permitted NOx emission rate of 0.26 lb/MMBtu, would be approximately $7,705 per ton of NOx removed. This figure is representative of the actual expected annual costs associated with the use of SNCR at WEPI. The application of SNCR on the biomass fired boilers would result in additional energy impacts. Operation of the SNCR would require approximately 12.6 KW per hour of electric power and an additional 204 tons of wood combusted annually in order to vaporize the water in the aqueous urea solution.

Furthermore, the application of SNCR to the biomass fired boilers would result in additional environmental impacts. Emissions of unreacted ammonia, known as ammonia slip, can result from the incomplete reaction of NOx and the reagent. The presence of unreacted ammonia in the boiler exhaust can react with sulfuric acid and nitric acid to form fine particles of ammonium sulfate and ammonium nitrate salts which primarily exist as fine particulate emissions ($PM_{2.5}$). Atmospheric $PM_{2.5}$ can cause light scattering and absorption and is a major contributor to visibility impairment. Due to the relatively short distances to the Class I areas of Acadia National Park, Moosehorn National Wildlife Refuge, and Campobello International Park, ammonia slip from the SNCR system would contribute to visibility impairment and plume visibility issues. At least one wood-fired boiler listed in the EPA's RBLC encountered significant visibility issues and, due to public insistence, had to abandon their SNCR system.

Based on the direct and indirect costs of installing and operating SNCR, it is found to be cost prohibitive to retrofit WEPI's existing biomass boilers with this equipment. In addition, the relatively short distances to Class I areas would result in visibility impairment and/or plume visibility issues due to ammonia emissions from an SNCR system.

NOx Averaging Time

The facility's NOx emission limits, both lb/hr and lb/MMBtu, were not historically monitored on a continuous basis. The NOx emission limits for WEPI are 0.23 lb/MMBtu and 35.2 lb/hr for each boiler (Boiler 1, 2, and 3). The current license states that the NOx lb/hr limit is on a one (1) hour average and can be demonstrated upon request by a stack test in accordance with the license. The method for documenting compliance with the NOx lb/MMBtu emission limit was not identified in the original license or subsequent renewals or amendments.

In July 2005, WEPI installed NOx continuous emission monitors (CEMS) as part of an agreement to be considered a renewable energy generator by the State of Massachusetts. WEPI has requested the NOx lb/MMBtu emission limit be based on a 24-hour block average basis, from midnight-to-midnight, for each boiler. A 24-hour block average basis is consistent with other biomass boilers licensed in Maine utilizing a NOx CEM and the 24-hour averaging methodology meets 06-096 CMR 138, NOx RACT standards.

The established BACT lb/hour NOx emission limit of 35.2 lb/hr, on a one (1) hour average for each boiler, will continue to be demonstrated by stack testing and remains unchanged per this request. Because of the inconsistent nature of the wood fuel, including seasonality variations (which also impact the feed system operations causing periodic plugs) and the variable nature of the operation, a 24-hour compliance period for the NOx lb/MMBtu emission limit is appropriate. WEPI will use its NOx CEM and follow the averaging periods as set appropriately for other biomass fired boilers and will follow the suggested averaging times outlined per 06-096 CMR 138.

NOx BACT Conclusion

BACT limits at Maine facilities range from 0.1 to 0.6 lb/MMBtu. BACT limits for boilers posted in the RBLC ranged from 0.15 to 0.44 lb/MMBtu. NOx emission limits included in CT and MA Renewable Portfolio Standards (RPS) do not necessarily correlate to PSD or Non-attainment NSR control technology analyses and in fact are considerably lower than BACT limits. The economic incentive to qualify for saleable Renewable Energy Credits (RECs) have fluctuated drastically and currently trade at about $33 per MW ($7,000,000

annual incentive for a 25 MW facility). This would incorporate a unique economic model into selection of emission controls which does not correlate to the economic analysis in PSD/NSR driven control technology review process. To further complicate matters, because CT and MA RPS pricing has been extremely variable it makes it risky for companies to justify large capital improvements based on unreliable future REC revenue estimates.

Therefore, the Department finds that WEPI's unit design, which includes fluidized bed combustion technology, coupled with good combustion practices, a 35.2 lb/hr NOx limit on each unit, and a limit of 0.23 lb/MMBtu, on a 24-hour average measured by a continuous emissions monitor, meets BACT.

4. Volatile Organic Compounds (VOC)

WEPI's current license limits VOC emissions to 13.6 lb/hr. VOC emissions from fluidized bed biomass boilers are inherently low. Add-on control technologies for VOC emissions have not been developed for boilers as reflected in a review of EPA's RBLC database and controls employed at other facilities in Maine. VOC controls are primarily used in industrial processes where VOCs are emitted through evaporation of solvents. VOC control technologies include incineration, catalytic oxidation, adsorption, and condensation. Essentially, the combustion chamber of a boiler acts as an incineration chamber and combusts the majority of VOCs. The small fraction of VOCs that escape are the result of incomplete combustion of fuel and are diluted by excess airflow through the boiler. Because of the low quantity and concentration of VOC in the flue gas, add-on control technologies are not considered technically feasible for WEPI's biomass boiler.

The Department finds that maintaining good combustion practices with a VOC limit of 13.6 lb/hour demonstrated by stack test meets BACT.

5. Carbon Monoxide (CO)

WEPI's original CO license determination was a limit of 0.192 lb/MMBtu, however, after the installation of a CO monitor, it has shown that the original determination was not appropriate and therefore needs to be changed.

Carbon Monoxide is a colorless, odorless gas formed as an intermediate product of combustion. CO emissions result when there is insufficient residence time or if there is insufficient oxygen available near the hydrocarbon molecule during combustion to complete the final step in hydrocarbon oxidation. CO emissions can be controlled through combustion control techniques or by add-on technology.

For the proposed CO modification, a BACT analysis was conducted by first researching relevant BACT precedents. Specifically, this entailed identification of the various control technologies that have been applied in the recent past to other similar projects. This information was obtained from reviews of EPA's RACT/BACT/LAER Clearinghouse (RBLC) and recent New Source Review (NSR) licenses and applications for similar projects in Maine. The complete RACT/BACT/LAER Clearinghouse Report is included in Appendix D of WEPI's application dated January 24, 2008.

Based on the review of the RBLC and other technical sources, the potential control technologies for CO emissions from biomass fired boilers include the following:

- Add-on controls (oxidation catalyst, thermal oxidation)
- Combustion Control Techniques (i.e., good combustion practices)

Catalytic oxidation is a post combustion control technology that has been used extensively with gas turbines and internal combustion engines. Catalysts are typically based on a noble metal and operate by decreasing the temperature at which oxidation of CO will occur. The catalyst lowers the activation energy necessary for CO to react with available oxygen in the boiler exhaust to produce CO_2. The operating temperature window of an oxidation catalyst is between approximately 400^0F - 1100^0F. Due to the design of the catalytic oxidation system, the combustion gasses must be relatively clean to keep the catalyst from becoming plugged. As a result, a catalytic oxidation system is typically installed downstream of a particulate matter (PM) control device. In the case of WEPI, an electrostatic precipitator (ESP) is utilized to remove PM from the combustion gasses. The temperature of the flue gas immediately following the ESP is lower than the optimal catalyst operating temperature range necessary for the system to run properly. Methods that could be used to meet the temperature range requirements of a catalytic oxidation system include plugging a portion of the air heater tubes or completely bypassing the air heater itself. Both of these options would result in a decrease in boiler efficiency.

Because the catalyst has much of its surface area contained in relatively small pores, catalytic oxidation is very sensitive to particulate contamination from combustion exhaust gases such as those from biomass boilers. Location downstream of the ESPs involves additional emissions and capital expense associated with operation of a reheat burner. Typically, oxidation catalysts are used only on "clean" exhaust streams.

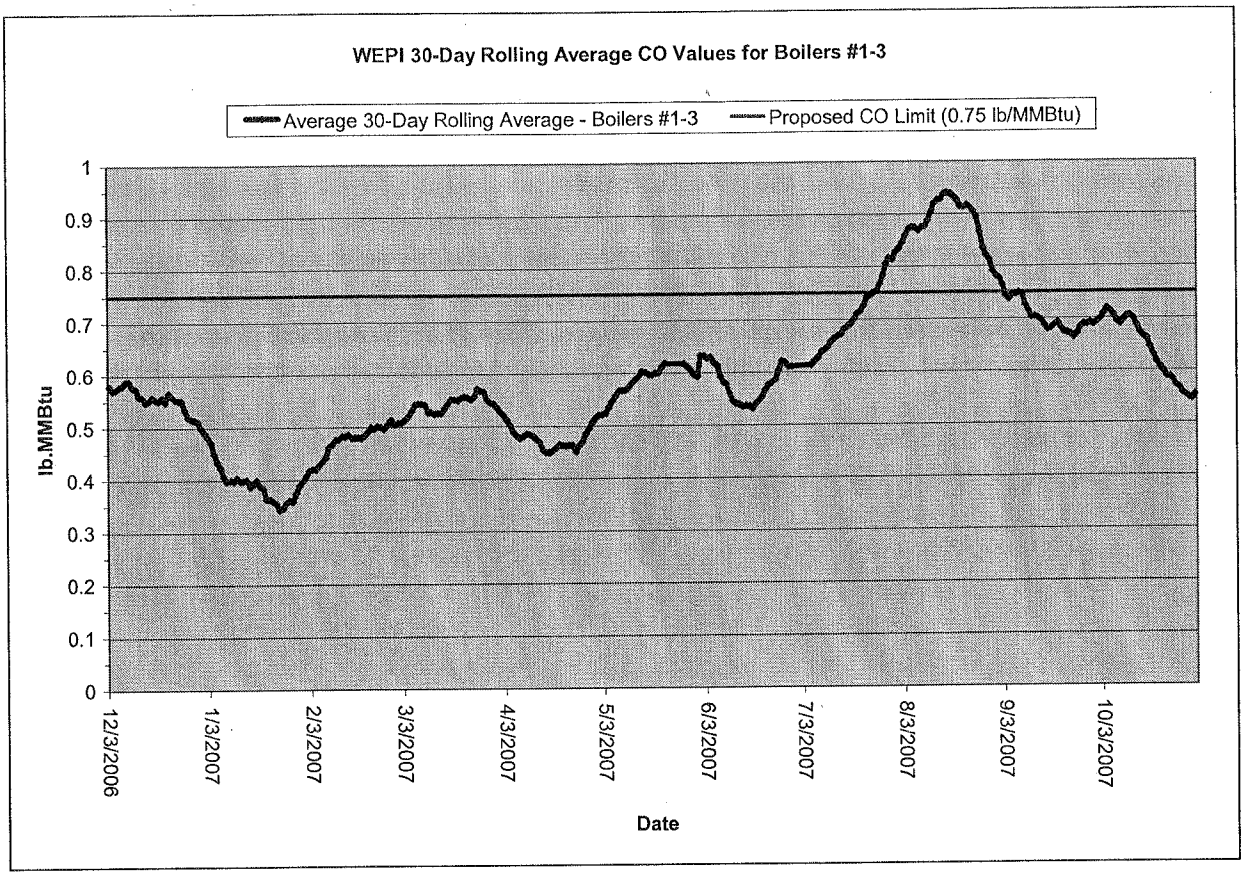
Another control technology that WEPI reviewed was thermal oxidation. Thermal oxidation is a control technology that reduces CO emissions in the flue gas using high temperature post combustion. Thermal oxidation is typically applied after the

ESP, and has been reported to achieve up to 95% reduction of CO in the exhaust gas on other types of industrial facilities. The application of thermal oxidation at WEPI would require additional fuel usage, and would result in additional secondary emissions. A review of the EPA's RACT/BACT/LAER Clearinghouse for biomass boilers revealed only one facility that utilizes thermal oxidation as BACT. However, the fuel burning unit itself is a thermal oxidizer, and additional controls are not required.

Therefore, the Department finds that CO reduction at WEPI using a catalytic oxidation system and/or thermal oxidation is neither technically nor economically feasible. The complete economic and technical feasibility studies for a CO catalyst and thermal oxidation are found in WEPI's application dated January 24, 2008.

After add-on pollution control was deemed inappropriate, based on economic or technical grounds for the exiting facility, the Department required WEPI's BACT analysis to justify the CO emission limits and combustion control techniques. The CO limits for fourteen recently licensed biomass fired boilers in Maine range from 0.08 lb/MMBtu to 1.5 lb/MMBtu with an average of the fourteen emission limits of 0.54 lb/MMBtu. A review of WEPI's CEM data records from December 3, 2006 through October 31, 2007 indicates that the average 30-day rolling average CO values for Boilers #1-3 varied from 0.34 lb/MMBtu to 0.94 lb/MMBtu. Daily individual boiler readings that exceeded 1.5 lb/MMBtu were excluded from these calculations, as CO readings at that level are more representative of periods of start-up or shutdown. The NOx CEM was installed July 2005, the CO CEM was installed in 1988 as part of a license renewal through Air Emissions License, A-216-72-C-R.

Average WEPI 30-Day Rolling Average CO Values for Boilers #1-3



The average 30-day rolling average CO values recorded at WEPI from June 2007 through October 2007, while higher than those recorded during the previous six month period, are more representative of typical CO values at the facility. The average 30-day rolling average CO value for this time period was 0.71 lb/MMBtu. Lower CO values were recorded at WEPI between December 2006 and May 2007, however the WEPI boilers combusted a very high grade of chipped round wood during this time period. This limited quantity of fuel was of an extremely high quality with low moisture and is not representative of the wood fuel typically available to the facility. Variability of wood moisture content also occurs seasonally, which can compound the difficulty in combusting a consistent wood fuel quality.

The complete evaluation of the lb/MMBtu 30-day rolling CO averages from the facility's boilers is included in the application dated January 24, 2008. The Department and EPA have determined that an averaging period of 30 days is appropriate for CO emissions from wood-fired units to accommodate short term spikes in emissions caused by variable fuel characteristics, such as moisture

content and temperature. Wood is typically stored outside subject to the weather. During the rainy season, or after a rain/snow storm, the wood is wet and does not burn as well resulting in higher CO emissions. Also, the operating load of the boiler will affect CO emissions, where a decrease in load may increase CO emissions. Swings in emissions due to variable fuel characteristics is a challenge for every biomass facility in Maine and is not unique to WEPI, however, because of WEPI's relatively smaller boiler sizes the swings can be intensified at times. To account for these factors, the Department decided on a 30-day average.

The Department has issued 30-day rolling CO limits in the past, however facilities need to perform air dispersion modeling to show compliance with 1 hour and 8 hour ambient air quality standards based on this same limit. In order to proactively address this gap and because EPA and Maine DEP have recognized this issue, WEPI used an emission rate of 1.5 lb/MMBtu in its air dispersion modeling demonstration to show compliance with the 1-hr and 8-hr CO standards. The CO modeling demonstration prepared for Maine DEP showed that WEPI's contribution to air quality impacts were below significance levels at 835 $\mu g/m^3$ for the 1-hr impact and 250 $\mu g/m^3$ for the 8-hr impact as compared to the Maine Ambient Air Quality Standards (MAAQS) of 40,000 $\mu g/m^3$ and 10,000 $\mu g/m^3$, respectively. WEPI will be required to meet a CO limit of 203.25 lb/hr (1.5 lb/MMBtu) verified by stack tests, upon request by EPA or the Department.

Description of CO Emission Rate Modification

WEPI's current CO limit is 0.192 lb/MMBtu (26 lb/hr) when firing wood and oil for each boiler. Compliance with the current limit is demonstrated based on a 24-hour block average using data from the on-site CO Continuous Emissions Monitors (CEMs) installed in 1988. This license modification will change the CO emission rate for each boiler to 0.75 lb/MMBtu, based on a 30-day rolling average.

NOx and CO emissions are inversely proportional; meaning that operationally trying to decrease one pollutant can increase the other. With the ability to determine CO and NOx emissions continuously after the installation of a NOx CEM in 2005, WEPI has found the original CO limit of 0.192 lb/MMBtu impossible to meet on an ongoing basis. The combustion process is much better understood today and most facilities of this size now have continuous monitors for both CO and NOx emissions. The NOx emission limit of 0.23 lb/MMBtu along with the 0.192 lb/MMBtu CO emission limit, established in the late 1980's, were based on theory, independent stack tests, and prior to actual continuous operating data. These limits were carried forward in the current Part 70 Air Emissions License, A-216-70-A-I, issued June 26, 2002. WEPI also operates under a 30-day rolling average of 0.175 lb/MMBtu for NOx as part of its

Statement of Qualification as a renewable energy facility for Massachusetts. The original CO limit of 0.192 lb/MMBtu in conjunction with the NOx limit, however, is only achievable for short periods of time. For this type of operation, the influence of fuel quality, including moisture and seasonality, on the formation of both CO and NO_x emissions has been found to be significant in the active combustion zone. Boiler load, excess air, as well as fuel moisture impact CO emission levels significantly.

Although CO is a regulated pollutant, ambient air quality modeling for this source and throughout the state has consistently shown that Maine does not have CO levels that threaten the environment or adversely affect human health. This is also the case for Deblois, Maine, and specifically for WEPI's major modification request, as documented per Section VI "Ambient Air Quality Analysis" of this license. WEPI has not seen an increase in VOC or HAP emissions and has recently conducted both VOC and acrolein testing that documented compliance with the VOC limit. Acrolein testing was done over a period of three days, December 18th, 19th, and 20th, 2007 and resulted in a total of 0.132 lb/hr from the three boilers. This was an order of magnitude below expected emission levels based on EPA's Compilation of Air Pollutant Emission Factors (AP-42). Also, modeling for acrolein demonstrated that the facility meets Maine Ambient Air Quality Guidelines established by the Maine's Department of Health and Human Services.

Based on actual data obtained from the NOx and CO CEMs, from this facility and other similar facilities in the state, the Department approves the CO emissions rate increase. Good combustion practices incorporate a variety of factors including proper combustion techniques to control CO emissions by maintaining optimum combustion conditions within the boiler. Optimizing the factors of residence time, temperature, and mixing, maximizes boiler combustion efficiency, thereby minimizing CO emissions.

Good combustion practices are the most common method for controlling CO emissions from biomass fired boilers. BACT determinations for good combustion practices listed in the RBLC had CO limits ranging from 0.1 lb/MMBtu to 0.78 lb/MMBtu. BACT for CO control at WEPI is good combustion control achieved through proper combustion system operation, proper boiler maintenance and operator training, a limit of 101.3 lb/hr based on stack testing, and meeting a limit of 0.75 lb/MMBtu on a 30-day rolling basis.

BACT Summary

WEPI will continue to use bubbling fluidized bed combustion to ensure complete combustion to limit NOx, CO, and VOC emissions, and ESPs to control PM

emissions. To control SO_2 emissions, WEPI is proposing to continue to use inherently low sulfur fuels.

Emission limits proposed as BACT for WEPI's biomass boilers are summarized in the following table.

Supplemental BACT Emissions Summary

Pollutant	lb/MMBtu	lb/hour
PM/PM_{10}	0.02	3.7
SO_2	--	3.4
NOx	0.26	35.2
CO	0.75	101.3
VOC	--	13.6

C. BOILERS' STEAM PRODUCTION LB/HR LIMIT

WEPI is required per Condition (14) A of Air Emissions License, A-216-70-A-I, to limit steam production as currently stated by the following:

"Boiler 1, Boiler 2, and Boiler 3 steam production shall be limited to 84,000 #/hr (each), based on a 24 hour average. WEPI shall monitor and record steam flow rate and steam temperature continuously for each boiler. Note, "continuously" is defined as 3 points in a one hour period."

WEPI has requested to change this condition to better reflect manufacturer design standards. WEPI is not changing any operational parts to the boiler's original design nor boiler feed system. The increase in steam production is only the result of what the boiler was originally capable of producing and the 84,000 lbs/hr was conservative with the facility having seen spikes up to 92,400 lb/hr. The change will not require an increase in emission limits or affect WEPI's ability to meet its limits. The modified lb/hr steam limit of 92,400 is based on the boiler's Maximum Continuous Ratings (MCR) +/- 10%. The feed system, boiler air injection systems, and operating practices remain unchanged. No changes in emissions are allowed from this updated steam production limit.

D. START-UP, SHUT-DOWN, AND MALFUNCTIONS

WEPI shall utilize the provisions of 40 CFR Part 60, 38 MRSA 349 (9), and 06-096 CMR 101 for emissions exemptions from startup, shutdowns, and malfunctions from Boiler #1, Boiler #2 and Boiler #3.

Data obtained during periods of startup, shutdown, and malfunctions may not be included in determining compliance with averaging gaseous emission rates provided that operating records are available to demonstrate that the facility was being operated to minimize emissions. Data gathered during these times have frequent O_2 spikes that make emission calculations inappropriate.

O_2 Spikes – The Department will allow WEPI to make CEMS monitoring calculation corrections during periods of high O_2 (occasionally spikes to 21% during such events as fuel plugs, cleanings, start-up, and shutdowns). Data from periods of high O_2 (greater than 16% O_2) in the stack gas compromise the CEMS ability to appropriately account for CO and NOx lb/MMBtu emission rates, from monitored ppm emission rates, and are therefore not appropriate to be included for calculation purposes. In order to resolve this issue, the Department will allow the facility to flag the event as a startup, shutdown, or malfunction and exclude the data from being used in emission rate compliance calculations. Despite this allowance, WEPI is required to maintain and operate the wood fired units and ESPs in a manner consistent with good air pollution control practices for minimizing emissions per 40 CFR Part 60.7.

Startup ("cold") is defined as when the initial temperature of each boiler, measured at the probe box on the steam drum, is less than or equal to 250 °F. The probe box on the steam drum is being used since the boilers at WEPI are tied into a common steam header. The cold startup period of each boiler shall be implemented in the following manner:

1. Startup for a given boiler shall begin once fire has been put into that boiler.
2. Cold startup shall not exceed a maximum period of 8 hours on wood (4 hours on oil), not to include periods of time which are determined by the Department to be unavoidable malfunctions pursuant to 38 M.R.S.A., §349 (9).
3. Upon initiating the fire in a boiler, the 8-hour period shall begin, and shall continue regardless if the fire is removed from the boiler. If during the 8-hour period, WEPI experiences periods of time (fire in the boiler or not) which are determined by the Department to be unavoidable malfunctions pursuant to 38 M.R.S.A., §349(9), those periods of time shall not be counted as part of the 8-hour period.

A cold start-up sequence (without use of oil upon start-up) consists of the following series of events.

1. Fill boiler with a few yards of wood chips.
2. Ignite wood pile in boiler. (this initiates the 8-hour cold-startup allowance period)

3. Engage ID Fan (about 30 minutes after fire is started).
4. Slowly meter in fuel.
5. Several hours (1-3) after fire is lit engage primary air fan (also triggers CEMS to recognize the boiler as on-line).
6. Several hours later, after boiler flue gas has reached stable temperatures and an appropriate oxygen content, engage ESP.

Startup ("warm") and ("hot"), when the probe box on the steam drum is equal to or greater than 250°F, should be logged/recorded and requested for allowance per Title 38 MRSA § 349 (9).

NOx Emissions and Pollution Prevention Plan - WEPI's lb/MMBtu NOx emission limit is documented by CEMS and averaged over a 24 hour period. The CEM system and its underlying calculations (F factor) are not designed to accurately record emissions during start-up conditions as the stack parameters such as oxygen content are outside of the normal operating range. Start-up periods for wood fired boilers take longer than many other sources firing oil or gas because of the high moisture content of the wood fuel and variable nature of the operation. Furthermore, WEPI will prepare a pollution prevention plan that will focus on minimizing the frequency and duration of periodic maintenance allowances through a program of continuous operational and physical improvements. This pollution prevention plan will be submitted once annually for a period of five years to the Department on or before March 1st of each year.

E. SPECIFICATION WASTE OIL

WEPI has applied to burn up to 2,000 gallons of specification waste oil per year in the boilers. The combustion of waste oil, at a maximum of 2,000 gallons per year, will not increase licensed allowed emissions and is granted through this air license.

F. PEAT BAGGING

WEPI no longer owns the peat bagging building and operation. Therefore, to make the license consistent with facility operations, all license requirements that limited emissions associated with peat are no longer necessary and are removed from this license.

V. REVISED ANNUAL FACILY EMISSIONS SUMMARY

The following total licensed annual emissions for the facility has been updated per this NSR license and are based on the following raw materials used. All usages are based on a 12 month rolling total.

- Facility biomass use of 395,660 tons per year (4,500 Btu/lb, 50% moisture).
- 847,800 gallons combined of #2 fuel oil (0.05% sulfur by weight).
- Blackstart Generator fuel use of 106,087 gallons per year of diesel fuel (0.05% sulfur by weight) based on 1,500 hours per year of operation.
- 353 Generator fuel use of 10,616 gallons per year of diesel fuel (0.05% sulfur by weight) based on 500 hours per year of operation.

Total Licensed Annual Ton Per Year (TPY) Emissions for the Facility
(used to calculate the annual license fee)

Pollutant	Boiler (biomass)	Blackstart Generator	353 Gen set	Total TPY
PM	49.8	0.9	0.1	**50.8**
PM_{10}	49.8	0.9	0.1	**50.8**
SO_2	47.4	0.4	0.1	**47.9**
NO_X	480.9	23.3	3.2	**507.4**
CO	1335.4	6.2	0.7	**1342.3**
VOC	177.7	1.1	0.3	**179.1**
NH_3	69.2	--	--	**69.2**
Lead	0.51	--	--	**0.51**

VI. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined modeling analysis was performed to show that emissions from WEPI, in conjunction with other sources, will not cause or contribute to violations of Maine Ambient Air Quality Standards (MAAQS) for SO_2, PM_{10}, NO_2 or CO or to Class II increments for SO_2, PM_{10} or NO_2. While the proposed major modification for WEPI is for CO only, WEPI has chosen to update the modeling analysis to include SO_2, PM_{10} and NO_2.

Based upon the distance from WEPI to the nearest Class I area (32 kilometers) and the magnitude of increased CO emissions, the affected Federal Land Managers (FLMs) and MEDEP-BAQ have determined that an assessment of Class I increment standards and Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERMOD-PRIME refined model was used to address standards and increments in all areas. All modeling was performed in accordance with all applicable

requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid 5-year hourly off-site meteorological database was used in the AERMOD-PRIME refined modeling analysis. Wind data was collected at 10 and 76 meters at the Georgia-Pacific meteorological monitoring site, located in Old Town, during the 5-year period 1991-1995. When possible, surface data collected at the Bangor NWS site were substituted for missing surface data. All other missing data were interpolated or coded as missing, per EPA guidance. In addition, hourly Bangor NWS data, from the same time period, were used to supplement the primary surface dataset for required variables that were not explicitly collected at the Georgia-Pacific monitoring site.

Surface meteorological data was combined with concurrent hourly cloud cover and upper-air data obtained from the Caribou National Weather Service (NWS). Missing cloud cover and/or upper-air data values were interpolated or coded as missing, per EPA guidance.

All necessary representative micrometeorological surface variables (surface roughness, Bowen ratio and albedo) for inclusion into AERMET were calculated from procedures specified by USEPA.

The modeling analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula GEP stack heights.

Point-source parameters, used in the modeling for WEPI, are listed in Table III-1.

TABLE III-1: Point Source Stack Parameters

Facility/Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD27 (km)	UTM Northing NAD27 (km)
WEPI						
CURRENT/PROPOSED						
• Stack 1	67.10	56.39	83.79	1.60	576.507	4953.817
• Stack 2	67.10	56.39	83.79	1.60	576.504	4953.806
• Stack 3	67.10	56.39	83.79	1.60	576.500	4953.796
1987 BASELINE						
WEPI						
WEPI not operational in 1987, no NO_x credits to be taken.						
1977 BASELINE						
WEPI						
WEPI not operational in 1977, no SO_2 or PM_{10} credits to be taken.						

Emission parameters for WEPI, based on the worst-case operating scenario (100% load case), for MAAQS and increment modeling are listed in Table III-2. For the purposes of determining PM_{10} and NO_2 impacts, all PM and NO_x emissions were conservatively assumed to convert to PM_{10} and NO_2, respectively.

TABLE III-2 : Stack Emission Parameters

Facility/Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	NO_2 (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
CURRENT/PROPOSED							
WEPI							
• Stack 1	All	0.43	0.47	4.44	25.60	450.00	11.46
• Stack 2	All	0.43	0.47	4.44	25.60	450.00	11.46
• Stack 3	All	0.43	0.47	4.44	25.60	450.00	11.46
1987 BASELINE							
WEPI							
WEPI not operational in 1987.							
1977 BASELINE							
WEPI							
WEPI not operational in 1977.							

C. Single Source Modeling Impacts

AERMOD-PRIME refined modeling, using five years of sequential meteorological data, was performed for four WEPI operating scenarios that represented maximum, typical and minimum operations.

The modeling results for WEPI alone are shown in Tables III-3. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. No further modeling was required for pollutant/terrain combinations that did not exceed their respective significance levels.

TABLE III-3: Maximum AERMOD-PRIME Impacts from WEPI Alone

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Significance Level ($\mu g/m^3$)
SO_2	3-hour	9.32	576.204	4953.506	65.00	**25**
	24-hour	2.38	577.104	4953.406	61.23	**5**
	Annual	0.17	576.204	4953.506	65.00	**1**

PM_{10}	24-hour	2.60	576.204	4953.506	65.00	**5**
	Annual	0.19	576.204	4953.506	65.00	**1**
NO_2	Annual	**1.76**	576.204	4953.506	65.00	**1**
CO	1-hour	834.59	576.254	4953.556	66.00	**2000**
	8-hour	249.83	577.004	4953.506	58.03	**500**

D. Combined Source Modeling Impacts

For predicted modeled impacts from WEPI alone that exceeded significance levels, as indicated in boldface type in Table III-3, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the area.

Background concentrations for use in the Eastern Maine region, listed in Table III-4, were derived from representative rural background data, per USEPA guidance.

TABLE III-4 : Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Data Source
NO_2	Annual	11	TLSP Site, Cape Elizabeth - 1995

MEDEP examined other area sources whose impacts would be significant in or near WEPI's significant impact area. Due to WEPI's location, extent of the significant impact area and nearby source's emissions, MEDEP has determined that no other sources would be considered for combined source modeling.

Table III-5 summarizes maximum combined source impacts. The maximum modeled combined source impacts, based upon high-second-high values, were added with the background concentrations to demonstrate compliance with MAAQS, as shown in Table III-5. Because all pollutant/averaging period impacts using this method meet MAAQS, no further MAAQS modeling analyses need to be performed.

TABLE III-5 : Maximum AERMOD-PRIME Combined Sources Impacts

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Back-Ground ($\mu g/m^3$)	Max Total Impact ($\mu g/m^3$)	MAAQS ($\mu g/m^3$)
NO_2	Annual	**1.76**	576.204	4953.506	65.00	**11**	**12.76**	**100**

E. Increment

The AERMOD-PRIME refined model was used to predict maximum Class II increment impacts in all areas.

Results of the Class II increment analysis, based upon high-second-high values, are shown in Tables III-6. All modeled maximum increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no further Class II SO_2, PM_{10} and NO_2 increment modeling needed to be performed.

TABLE III-6 : Class II Increment Consumption

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	**9.32**	576.204	4953.506	65.00	**512**
	24-hour	**2.38**	577.104	4953.406	61.23	**91**
	Annual	**0.17**	576.204	4953.506	65.00	**20**
PM_{10}	24-hour	**2.60**	576.204	4953.506	65.00	**30**
	Annual	**0.19**	576.204	4953.506	65.00	**17**
NO_2	Annual	**1.76**	576.204	4953.506	65.00	**25**

Federal regulations and 06-096CMR140 require that any source undergoing a major modification provide additional analyses of impacts that would occur as a direct result of the general, commercial, residential, industrial and mobile-source growth associated with the construction and operation of that source.

Because no physical changes are being proposed at WEPI, nor will any new jobs be created as part of this modification, no emissions increases in commercial, residential, industrial and mobile-source growth are expected to occur. Therefore, more detailed growth analyses are not required.

F. Class I Impacts

Based upon the distance from WEPI to the nearest Class I area (32 kilometers) and the magnitude of increased CO emissions, the affected Federal Land Managers (FLMs) and MEDEP-BAQ have determined that an assessment of Class I increment standards and Air Quality Related Values (AQRVs) is not required.

G. Summary

In summary, it has been demonstrated that WEPI in its proposed configuration will not cause or contribute to a violation of any SO_2, PM_{10}, NO_2 or CO averaging period MAAQS or any SO_2, PM_{10} or NO_2 averaging period Class II increment standards.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-216-77-1-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the standard and special conditions below.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in 06-096 CMR 115. [06-096 CMR 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an

extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115] **Enforceable by State Only**

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353. [06-096 CMR 115]
Enforceable by State Only

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:

A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:

1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
2. pursuant to any other requirement of this license to perform stack testing.

B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. submit a written report to the Department within thirty (30) days from date of test completion.

[06-096 CMR 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[06-096 CMR 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emission and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department

within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [06-096 CMR 115]
Enforceable by State Only

SPECIFIC CONDITIONS

The following conditions supersede all previous NSR and PSD conditions in Air Emission License, A-216-73-A-N, and subsequent amendments & renewals pertaining to Boilers 1, 2, 3, and will eventually replace such conditions in the Part 70 Air Emissions License, A-216-70-A-I.

(1) WEPI no longer operates the Peat Bagging System therefore monitoring visible emissions from that system is no longer required.
[06-096 CMR 115, BACT]

(2) **Boilers 1, 2, and 3**

(A) The steam production from Boiler 1, Boiler 2, and Boiler 3 shall be limited to 92,400 lbs/hr (each), based on a 24 hour average. WEPI shall monitor and record steam flow rate and steam temperature continuously for each boiler.

(Note: "continuously" is defined as 1 point in each of the four successive 15-minute quadrants of the hour. A minimum of one data point in a least three of the four distinct 15-minute quadrants constitutes a valid hour)

Each parameter monitor must record accurate and reliable data. If the parameter monitor is recording accurate and reliable data less than 98% of the source-operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the parameter monitor was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate

and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions.
[06-096 CMR 115, BACT]

(B) The two 33.0 MMBtu/hr auxiliary oil-fired burners may be utilized for startup in each boiler (Boiler 1, 2 and 3). The auxiliary burners shall fire #2 fuel oil with a fuel sulfur content not to exceed 0.05% by weight. WEPI shall not fire more than 847,800 gallons of oil (#1 and #2 fuel combined) in boilers based on a 12 month rolling total (<10% capacity factor). Reference 40 CFR Parts 60.42b(d) and 60.44b(c)).
[06-096 CMR 115, BACT]

(C) Emissions from each boiler (Boiler #1, #2 and #3) shall not exceed the following limits when firing wood and oil:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.02	A-216-77-1-A, BACT
PM_{10}	0.02	A-216-77-1-A, BACT
NO_x	0.23	A-216-77-1-A, BACT
CO	0.75	A-216-77-1-A, BACT

CO: The 0.75 lb/MMBtu limit for each boiler is based on a 30 day rolling average basis via CEM. WEPI shall maintain the CO CEM in accordance with 06-096 CMR 117. The 30-day rolling average shall be calculated as described in 40 CFR Part 60 Method 19, equation 19-19. Or simply stated: the sum of the block hour values monitored for the last 30 emission unit operating days divided by the sum of the number of block hours monitored for the past 30 emission unit operating days. The CEM shall meet the monitoring requirements of 40 CFR Part 60.13 as well as 40 CFR Part 60, Appendices B and F.

NO_x: The 0.23 lb/MMBtu limit for each boiler will be based on a 24-hour block average basis via CEM. All valid NO_x hourly values shall be used to calculate emissions (sum divided by number of hourly readings). (Reference 06-096 CMR 138 (3)(K)). WEPI shall maintain each NO_x CEM in accordance with 06-096 CMR 117. A 24-hour block average basis shall be defined as midnight to midnight. At least 18 valid hours is required to calculate a 24-hour average. The NO_x CEMs (each stack) shall meet the monitoring requirements of 40 CFR § 60.13 as well as 40 CFR Part 60, Appendices B and F.

(D) Lb/hr emissions from each boiler (Boiler #1, #2 and #3) shall not exceed the following limits [06-096 CMR 115, BACT]:

Pollutant	lb/hour	Origin and Authority
PM	3.7	A-216-77-1-A, BACT
PM_{10}	3.7	A-216-77-1-A, BACT
SO_2	3.4	A-216-77-1-A, BACT
NO_X	35.2	A-216-77-1-A, BACT
CO	101.3	A-216-77-1-A, BACT
VOC	13.6	A-216-77-1-A, BACT

The lb/hr emission limits will be demonstrated by EPA approved stack test Methods in accordance with EPA standards and this license. These emission limits apply at all times including Startup, Shutdown, and Malfunctions (SSM).

(E) WEPI shall, calibrate, maintain, and operate a continuous emission monitoring system for O_2 for each of the boilers. The monitoring system shall comply with 06-096 CMR 117 and 40 CFR Part 60, Appendix B, Performance Specification 3.
[06-096 CMR 115, BACT]

(F) Emissions from Boilers #1, #2, and #3 shall vent to Stacks 1, 2, and 3, respectively, each shall be at least 185 feet AGL. No building taller than 110 feet AGL shall be constructed within 550 feet of the nearest boiler stack without the prior approval of the Department.
[06-096 CMR 115, BACT]

(G) Particulate matter (PM, PM_{10}) emissions from Boilers #1, #2 and #3 shall be controlled by the operation and maintenance of an electrostatic precipitator (ESP). Except during start-up, shutdown, and unavoidable malfunctions, ESPs for each operating boiler shall be operating during normal plant operating conditions. WEPI shall meet the 98% uptime requirement for parameter monitors as specified in Specific Condition (2)(A). Data for the following points in each ESP shall be recorded once per shift during operation:

1) Primary voltage on each field
2) Primary and secondary current on each field

WEPI shall operate, at a minimum, the number of fields which successfully demonstrated compliance during the most recent PM stack test. Upon written

notification to the Department, and in accordance with the Bureau of Air Quality's Air Emission Compliance Test Protocol, WEPI may perform additional particulate emission testing to demonstrate compliance with alternative operating scenarios, but under no circumstances shall WEPI be relieved of its obligation to meet its licensed emission limits.
[06-096 CMR 115, BACT & 40 CFR Part 64]

(H) Except during periods of start-up (per Condition 5), planned shutdowns, and unavoidable malfunction, as defined in the Finding of Fact, WEPI shall operate Boilers #1, #2 and #3 such that the opacity from each boiler does not exceed 20% over a six minute average except for one six minute period per hour of not more than 27%, subject to the provisions of 40 CFR Part 60 Subpart A and 38 MRSA § 349(9). [06-096 CMR 115, BACT]

(I) Compliance with the opacity limit shall be demonstrated by means of a continuous opacity monitoring system (COM). The COM shall be installed and certified on the breaching of the ESP to the stack or in the stack for each boiler. WEPI shall maintain the COM in accordance with 06-096 CMR 117.
[06-096 CMR 115, BACT]

(J) Boilers 1, 2 and 3 are subject to 40 CFR Part 60 Subparts A and Db and WEPI shall comply with the notification and record keeping requirements of 40 CFR Part 60.7.

40 CFR Part 60 Subpart Db requires maintaining records of the amount of fuels combusted each day and calculation of annual capacity factor for each calendar quarter. This requirement was directed toward multifuel boilers to determine the annual capacity firing fossil fuel. EPA Region I determined this requirement is not meant to apply to 100% wood fired systems. However, WEPI will be required to maintain monthly fuel use records and determine an annual capacity factor on a 12 month rolling average basis with the new annual capacity calculated at the end of each month and submitted annually.
[40 CFR Part 60 Subpart Db]

(K) Ash from the three boilers' grate, mud-drum, and fly-ash shall be disposed of in accordance with the Bureau of Remediation and Waste Management (BRWM). Ash shall be sufficiently conditioned with water or transported in covered containers so as to prevent fugitive emissions.
[06-096 CMR 115, BACT] **Enforceable by State Only**

(L) Should wind action or handling of reclamation of wood chips result in visible emissions in excess of 5% opacity, the chips shall be controlled to eliminate visible emissions in excess of 5% opacity on a six (6) minute average.

[06-096 CMR 115, BACT]

(M) WEPI shall notify the regional Air Bureau inspector and Air Bureau Licensing section of any fuel pile fires by the next business day.
[06-096 CMR 115, BACT] **Enforceable by State Only**

(3) **Stack Testing** [06-096 CMR 115, BPT]

- All stack testing programs shall comply with all of the requirements of the MEDEP Compliance Test Protocol and with 40 CFR Part 60, as appropriate.
- A PM stack test shall be performed on a boiler (Boiler 1, 2, or 3) by December 31 of every other year if that boiler has been run for more than 2,000 hours since the last PM stack test was performed. If the boiler has not operated more than 2,000 hours since the last PM stack test, WEPI shall conduct a PM stack test by December 31 within the calendar year of the unit reaching 2,000 hours of operation. This stack test shall initiate the timeframe for the next every other year PM stack test on that boiler. The most recent stack test was completed in December 2007.

(4) WEPI may burn up to 2,000 gallons of specification waste oil generated on-site in a rolling 12-month period provided that all the following conditions are met:

1) The waste oil is not considered hazardous waste, and meets the standards for specification waste oil;
2) The sulfur content of the waste oil does not exceed 0.5%; and
3) Records are kept of the quantity and type of waste oil burned.

[06-096 CMR 115, BACT]

(5) Initiation of Start-up: [06-096 CMR 115, BACT]

1. Startup for a given boiler shall begin once fire has been put into that boiler.
2. Cold startup shall not exceed a maximum period of 8 hours on wood (4 hours on oil), not to include periods of time which are determined by the Department to be unavoidable malfunctions pursuant to 38 M.R.S.A., §349 (9).
3. Upon initiating the fire in a boiler, the 8-hour period shall begin, and shall continue regardless if the fire is removed from the boiler. If during the 8-hour period, WEPI experiences periods of time (fire in the boiler or not) which are determined by the Department to be unavoidable malfunctions pursuant to 38 M.R.S.A., §349(9), those periods of time shall not be counted as part of the 8-hour period. The date, duration, and magnitude of

the excursion periods shall be listed in the quarterly report. **Enforceable by State Only**

(6) For Boiler #1, Boiler #2, and Boiler #3, the CEM data during Startup/Shutdown/Malfunction, when O_2 levels are greater than 16%, will not be included in the 24-hour or 30-day averages provided that the operating records are available to demonstrate that the facility was being operated to minimize emissions per 38 MRSA §349(9). Periodic fuel related upsets will qualify as SSM events (for gaseous emissions) provided WEPI is operated in a manner to minimize the frequency of these upsets. The date, duration, and magnitude of the SSM periods including hourly CO and NOx ppm and percent O_2 monitored values shall be listed in the quarterly report.

[06-096 CMR 101 & 06-096 CMR 115, BACT]

(7) **CEMS and COM Installation & Monitoring Schedule**

WEPI shall document compliance with NO_x, CO and opacity limits using CEMs and COMs in accordance with state and federal requirements.

[40 CFR Part 60., 06-096 CMR 115, BACT, 06-096 CMR 117]

(8) **CEMS, COMS, and Parameter Monitors**

The CEMS, COMS, and parameter monitors required by this license shall be the primary means of demonstrating compliance with emission standards set by this Order, statute, state or federal regulation, as applicable. WEPI shall comply with the following:

A. **Performance Specifications** [06-096 CMR 117 & 40 CFR Part 60]

All CEMS and COMS shall meet the sampling and performance criteria specified in 40 CFR Part 51 Appendix P, and shall be operated in accordance with 40 CFR Part 60 Appendix F and 06-096 CMR 117 of the Departments regulations.

1. If the continuous emission monitoring system for the gaseous emissions is recording accurate and reliable data less than 90% of the source-operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the CEMS was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction of the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions.

2. If the continuous opacity monitoring system is recording accurate and reliable data less than 95% of the source-operating time within any quarter of the calendar year, the Department may initiate enforcement action and may include in that enforcement action any period of time that the continuous emission monitoring system was not recording accurate and reliable data during that quarter unless the licensee can demonstrate to the satisfaction so the Department that the failure of the system to record accurate and reliable data was due to the performance of established quality assurance and quality control procedures or unavoidable malfunctions.
3. Conduct Relative Accuracy Testing (RATA) and/or Performance Audits in accordance with 06-96 CMR 117 of the Department's regulations unless the unit has not had 168 unit operating hours, as defined in Part 72, in a quarter then that quarter shall be excluded in determining the deadline for the next RATA. If the RATA has not been completed by the end of the eighth calendar quarter since the quarter of the last RATA, then the RATA must be completed within a 720 unit operating hour grace period following the end of the eighth successive elapsed calendar quarter, or the data from the CEMS will become invalid.

   WEPI shall perform a cylinder gas audit (CGA) in accordance with 40 CFR Part 60, Appendix F if Boiler 1, 2 and/or 3 were run during the quarter. CGA's may be conducted at any load. Upon request of WEPI, DEP may waive the requirement in 06-096 CMR 117 that notice be provided 10 days in advance of a CGA and the requirement in 06-096 CMR 117 and 40 CFR Part 60, Appendix F that CGA's must be conducted no less than 60 days apart.

4. Develop and maintain an updated quality assurance plan for all CEMS and COMS in accordance with 40 CFR Part 60 Appendix F and 06-096 CMR 117 of the Department's regulations.

B. **Recordkeeping** [06-096 CMR 117 and 115, BACT & 40 CFR Part 60, 51, and 75] For all of the continuous emission monitoring (CEMS), continuous opacity monitor (COM), equipment parameter monitoring and recording, required by this license, the licensee shall maintain records of the most current six year period and the records shall include:

1. Documentation which shows monitor operational status during all source operating time, including specifics for calibration and audits; and

2. A complete data set of all monitored parameters as specified in this license. All parameter records shall be made available to the Bureau of Air Quality upon request.

3. In the event that Boiler #1, #2, or #3 is in the process of a cold startup, WEPI shall monitor and record Steam Drum Temperature prior to start-up. During cold startup, WEPI shall also record the opacities which are greater than 20% a on a six minute average, except for one 6 minute period per hour of not more than 27% opacity. The record keeping associated with cold startup shall be considered part of WEPI's periodic monitoring program.

4. For all CEMS and COM, the records shall include:

   a. Documentation that all CEMS and COM are continuously accurate, reliable and operated in accordance with 06-096 CMR 117, 40 CFR Part 51, Appendix P, and 40 CFR Part 60, Appendices B and F;

   b. Records of all measurements, performance evaluations, calibration checks, and maintenance or adjustments for each CEMS and COMS as required by 40 CFR Part 51 Appendix P;

   c. Upon the written request by the Department a report or other data indicative of compliance with the applicable emission standard for those periods when the CEMS or COMS were not in operation or produced invalid data. Methods allowed by 40 CFR Part 75 may be used to demonstrate compliance with applicable emission standards. Evidence indicating normal operations shall constitute such reports or other data indicative of compliance with applicable emission standards. In the event the Bureau of Air Quality does not concur with the licensee's compliance determination, the licensee shall, upon the Bureau of Air Quality's request, provide additional data, and shall have the burden of demonstrating that the data is indicative of compliance with the applicable standard; and

   d. A 24-hour block average basis shall be calculated as the arithmetic average of not more than 24 – one hour block periods. Only one 24-hour block average shall be calculated for one day, beginning at midnight. A valid 24-hour block average must contain at least 18

hours during which operation occurred. Hours in which no operation occurs shall not be included in the 24-hr block average calculation.

(9) **Air Toxics Emissions Statement [06-096 CMR 137]**

If WEPI combusts more than 4,700 tons of wood during a HAP inventory year (50% moisture or equivalent), an Air Toxics Emission Statement is required unless data is presented detailing the HAP emissions factors for the facility are different than that used by the Toxics Inventory Coordinator.

The licensee shall report HAP emissions (in accordance with 06-096 CMR 137), the information necessary to accurately update the State's toxic air pollutants emission inventory, by means of a written emission statement containing the information required in 06-096 CMR 137.

Reports and questions on the Air Toxics emissions inventory portion should be directed to:

Attn: **Toxics Inventory Coordinator**
Maine DEP
Bureau of Air Quality
17 State House Station
Augusta, ME 04333-0017

DONE AND DATED IN AUGUSTA, MAINE THIS 10th DAY OF March 2009.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: James P. Brooks for
DAVID P. LITTELL, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: January 28, 2008
Date of application acceptance: February 6, 2008

Date filed with the Board of Environmental Protection:

FILED
MAR 11 2009
BOARD OF ENVIRONMENTAL PROT.
STATE OF MAINE

This Order prepared by Edwin Cousins, Bureau of Air Quality.